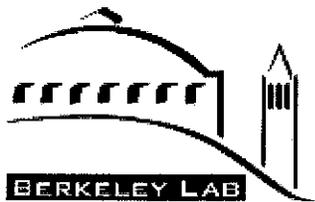
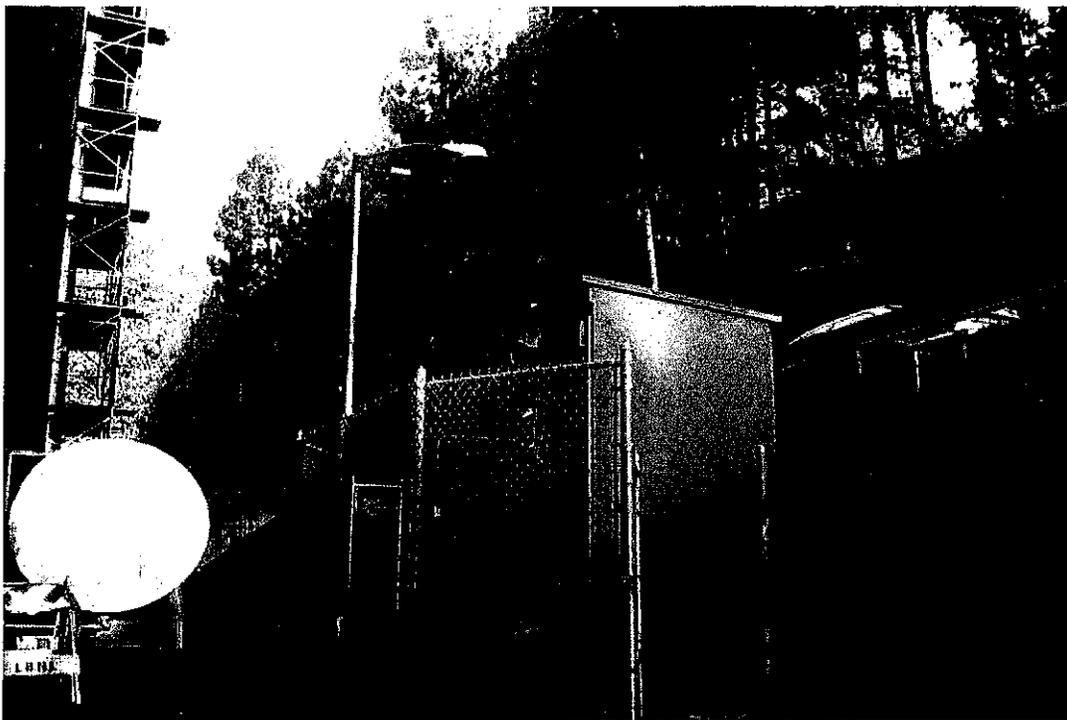


LBNL Emergency Services Program



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## **DECEMBER 14, 2009 POWER OUTAGE AFTER ACTION REPORT**

April 2010

**Security Emergency Operations Group  
Environment, Safety, and Health Division**

LBNL/Power Outage  
Effective Date: April 2010

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## Incident Summary

LBNL experienced a widespread power outage December 14, 2009 at approximately 10:10 a.m. The first 911 call was received at 10:11 am. The cause of the power outage was believed to be a high voltage switch fault. Approximately one-third of the Lab buildings were affected. There were no injuries reported. By 12:30 p.m. power was restored to all of the impacted buildings with the exception of the Building 90 complex. Employees in Building 90 evacuated the building and were later released for the remainder of the day. Building 90 went on external generator power later that day and all repairs were expected to be completed by December 19, 2009. Building 62 had no ventilation after the power was restored. Researchers were asked to safely shut down their experiments until the air flow was restored. Building 71 also lost power temporarily, but it was restored in the afternoon. Building 2 experienced a problem when the fume hoods did not come back on-line after the power was restored. Employees in Building 2 were evacuated as a precaution until the fume hoods were turned back on. All of the fume hoods in Building 2 were turned back on by 3:00 PM. As a result of the evacuation due to safety concerns, an ORPS report was generated. All other evacuations were temporary and minimal. There were sporadic reports of telephone and computer network outage which have been corrected.

An After Action meeting was held on December 15, 2009 at 2:30 PM. Invited staff included Lab Executive staff, DOE/BSO, Emergency Operations Center staff, Facilities Division staff, Building Managers, Assistant Building Managers, Building Emergency Team Leads, Building Emergency Team Members, Division Safety Coordinators, and EH&S Safety Liaisons. Comments and recommendations were received from the meeting attendees as well as via email from staff unable to attend the meeting. Those comments have been captured and summarized in this After Action Report.

## Findings

Although there were no findings, there are 3 observations with corrective action recommendations.

## Improvement Items

Description	Recommendation(s)
<b>General Communications</b>	
Discrepancy of time of event happening in the original notification.	<ul style="list-style-type: none"> <li>• EOC will provide the most accurate situation information that is known at the time and make corrections as needed.</li> </ul>
Building Managers wanted more frequent communications on status of the building in order to keep evacuated occupants notified.	<ul style="list-style-type: none"> <li>• Update EOC Public Information Officer procedures to issue more frequent notifications to all LBNL staff and Building Emergency Radio holders as needed.</li> <li>• Research the use of Twitter for notifications.</li> </ul>
Many people didn't know the web site or 800 number to use for event information.	<ul style="list-style-type: none"> <li>• Update EOC Public Information Officer procedures to issue more frequent notifications</li> </ul>

Description	Recommendation(s)
	<p>to all LBNL staff and Building Emergency Radio holders as needed.</p> <ul style="list-style-type: none"> <li>• Add the website address to LBNL Employee ID cards.</li> <li>• Develop a TABL article on this issue</li> <li>• Update EHS 135 All Hazard Awareness, EHS 154 BET Training and EHS 156 Building Manager Training.</li> </ul>
Information on the 1-800 emergency status announcement line was not updated when power actually was restored. The message stated that there is no emergency.	<ul style="list-style-type: none"> <li>• Update the EOC Public Information Officer procedures to develop an event termination message that summarizes the status of the event.</li> </ul>
Access the Lab homepage from the EOC.	<ul style="list-style-type: none"> <li>• IT to follow up.</li> </ul>
Simplify the instructions to update the 1-800 emergency status announcement line.	<ul style="list-style-type: none"> <li>• The instructions were simplified and circulated to Public Affairs and inserted into the EOC binders on December 16, 2009.</li> </ul>
Information to EOC was not verified before the EOC acted upon it.	<ul style="list-style-type: none"> <li>• EOC to review the information validation process.</li> </ul>
Monitor the Building Manager radio talk group.	<ul style="list-style-type: none"> <li>• Review the monitoring process of the Building Manager radio talk group with Security.</li> <li>• This is a task best suited for the proposed 24/7 Operations Control Center.</li> </ul>
<b>Public Address System</b>	
All PA announcements are site wide, no way to target specific areas or buildings.	<ul style="list-style-type: none"> <li>• IT to follow up.</li> </ul>
LBNL does not have enunciation capability through the fire alarm system.	<ul style="list-style-type: none"> <li>• BSO Fire Protection staff recommends that LBNL improve the fire alarm system to include enunciation capability.</li> </ul>
Building 71 PA system is not connected to the back-up power.	<ul style="list-style-type: none"> <li>• Facilities to follow up. Building Manager to submit a work request to have the back up generator support B71 PA system.</li> </ul>
<b>Bullhorns</b>	
Performance of the bullhorns currently being used is not consistent, sound is not loud, and does not carry.	<ul style="list-style-type: none"> <li>• Update bullhorn use procedures and training to use the siren sound first to get attention, and then speak through the bullhorn.</li> </ul>
All BET Leads do not have bullhorns.	<ul style="list-style-type: none"> <li>• Contact all BMs and BET Leads to determine if they have adequate/working bullhorns.</li> <li>• Research and purchase better quality bullhorns as needed.</li> </ul>
<b>Radios</b>	
There were not enough radios in B2. Had to use runners to share information with BET Lead.	<ul style="list-style-type: none"> <li>• To supplement the Building Emergency Radios, divisions are allowed to work with the LBNL Frequency Manager to buy low bandwidth radios for their BETs.</li> <li>• EOC will request more building manager radios.</li> <li>• IT to follow up on the possibility of using "push to talk" phones instead of some work cell phones.</li> </ul>

Description	Recommendation(s)
Radio Holders did not always use proper radio protocol when responding.	<ul style="list-style-type: none"> <li>Update radio protocol procedures and train radio holder to the new procedures.</li> </ul>
<b>Everbridge Notification System</b>	
Too many acronyms used in the automated Everbridge message.	<ul style="list-style-type: none"> <li>Create prerecorded messages and scripts for various scenarios that do not contain acronyms.</li> <li>Practice recording the notification messages by staff.</li> </ul>
Initial alert went to all ERO members, including Building Managers and BET members. Some members only got one method of alert (cell, but no beeper).	<ul style="list-style-type: none"> <li>Initial alerts will go to EOC staff only.</li> <li>Review EOC member contact list, verify all information is current.</li> </ul>
Use the polling feature to gather information regarding who will be available to report to the EOC.	<ul style="list-style-type: none"> <li>EOC to practice using the polling function in the Everbridge notification tests.</li> </ul>
<b>Web EOC</b>	
People had trouble logging in due to expired passwords.	<ul style="list-style-type: none"> <li>A solution has already been defined and will be implemented in 2010.</li> </ul>
<b>BET Training</b>	
Some BET members didn't know to turn on radio or how to mobilize in this incident.	<p>CATS item: Emergency Services Program to calendar BET meetings. Due: 07/30/10</p> <ul style="list-style-type: none"> <li>BETs across the lab, need to conduct regular meetings for training and drills.</li> <li>Training: Emphasize the importance of turning on radio for any possible emergency event.</li> <li>Clarify Power Outage response in training.</li> <li>Send out protocol reminders to all BMs, BETs, BET Leads</li> <li>Add protocol reminders to EHS 155 BET Seminar agenda.</li> <li>Clearly define different situations and how to respond and when to evacuate.</li> </ul>
There weren't enough BET members available in the affected buildings. There needs to be at least one BET Lead or Building Manager in each building.	<p>CATS item: Emergency Services Program to review and recommend Lab policy related to the Emergency Services Program, Building Managers and Building Emergency Teams to include the participation by Lab management in the emergency response process. Due: 09/30/10</p> <ul style="list-style-type: none"> <li>Increasing number of BETs and Building Managers will be looked at in 2010.</li> <li>Consider allowing/training BETs to work at buildings other than that assigned.</li> </ul>
<b>Evacuation</b>	
Employees unsure whether to evacuate buildings or not, so many self evacuated.	<p>CATS item: Emergency Services Program and Fire Protection need to develop evacuation triggers for power outages. Due: 07/30/10.</p>

Description	Recommendation(s)
	<ul style="list-style-type: none"> <li>• Make PA announcement to evacuate certain buildings.</li> <li>• Develop evacuation procedures for power outages.</li> <li>• Set an update/announcement time and announce through radios so BETs can pass information along.</li> <li>• Reinforce evacuation procedures in BET/BM Training.</li> <li>• Update EHS 135 as an online, lab-wide emergency training for all staff.</li> </ul>
There was conflicting information about reentering buildings and when that might be possible. No clear leadership to direct employees or provide information to them.	<ul style="list-style-type: none"> <li>• Increasing number of BETs and Building Managers will be looked at in 2010.</li> <li>• Consider allowing/training BETs to work at buildings other than that assigned.</li> <li>• Address this issue in the BET training.</li> </ul>
<b>Computer and Telephone Networks</b>	
VPN was overwhelmed by the amount of off-site log-ins, once people went home.	<ul style="list-style-type: none"> <li>• IT to follow up.</li> </ul>
Land-line phones in B90 did not work for a while. Some staff relied on cell phones to communicate between those who went home and those who stayed.	<ul style="list-style-type: none"> <li>• IT Communications to follow up.</li> </ul>
<b>Buildings</b>	
Some announcements used "B90" while some used "B90 complex", leading to uncertainty about exactly which buildings were involved.	<ul style="list-style-type: none"> <li>• Update radio holder training. Be very specific about locations involved in announcements</li> </ul>
Fume Hoods: If they had gone on to emergency power, how do you know?	<ul style="list-style-type: none"> <li>• Facilities Division to follow up.</li> </ul>
Card key system in B 90 trailers not on standby power, but on batteries.	<ul style="list-style-type: none"> <li>• Facilities Division to follow up.</li> </ul>
Hallways over lit.	<ul style="list-style-type: none"> <li>• Facilities Division to follow up. Review loads on generator so as not to waste fuel on unnecessary lighting.</li> </ul>
<b>Emergency Lights</b>	
A majority of the emergency lights worked in the affected buildings. The emergency lights that did not work were damaged by the power spike.	<ul style="list-style-type: none"> <li>• Facilities Division to follow up by conducting a review of all emergency lights and repair the damaged emergency lights.</li> </ul>

### Noteworthy Practices

Overall, the emergency response system at LBNL worked well. This incident was an opportunity to practice emergency response under live conditions without a life-threatening situation. This incident was referred to as "an unplanned drill". LBNL staff followed the directions provided and the emergency evacuation training they had received. Staff were compliant with the BET members when requested to evacuate buildings. The Building Managers and BETs provided support to their buildings and to the EOC as per the Building Manager training.

100 members (78%) of the ERO members notified through the Everbridge system responded to the notification. This response was consistent with the response to the monthly notification drills. The EOC staff were calm and professional in performing their responsibilities. The information being disseminated by multiple sources such as radio and Everbridge were consistent and reliable. The use of the 1-800 Emergency Status Announcement line, LBNL homepage and the Level-1 announcements functioned well.

### Lessons Learned

1. Do not use abbreviations in the Everbridge notification.
2. Use human voice notifications when possible.
3. Provide regular informational updates to LBNL staff and BETs throughout an event.
4. Building Management Program which consists of three elements (Facilities, Safety and Emergency Response) does not have an owner.
5. Building Emergency Teams need more members.

### Corrective Action Summary

Recommended Owner	Corrective Action	Due Date
<b>Emergency Services Program and Fire Protection</b>	Develop evacuation triggers for power outages.	07/30/10
<b>Emergency Services Program</b>	Review and recommend Lab policy related to the Emergency Services Program, Building Managers and Building Emergency Teams to include participation by Lab management in the emergency response process.	09/30/10
<b>Emergency Services Program</b>	Calendar BET meetings. BETs across the lab, need to conduct regular meetings for training and drills.	07/30/10